

## **REMARKS AND RESPONSES**

Claims 26 and 30-32 have been amended. Support for the amendments is found in the specification and claims as filed. Accordingly, the amendments do not constitute the addition of new matter.

Claims 1-10 and 22-25 have been cancelled without prejudice. As a result, claims 11-21 and 26-34 remain pending in the present application. Reconsideration of the application in view of the foregoing amendments and following comments is respectfully requested.

### **Specification - 35 U.S.C. §132(a) New Matter Objection**

For the sixth paragraph on page 5 (page 5, line 23 to page 6, line 8):

1. The office action stated that the “includes” used in “A monomer of the waterborne polyurethane includes 2,2-bis (hydroxymethyl) propionic acid” broadens the scope of the recited materials.

It is well known that polyurethane (PU) is usually pre-polymerized by a diisocyanate monomer and a diol monomer to form a PU prepolymer, and the chain length of the PU prepolymer is then extended by a chain extender, such as a diamine, to form the PU (page 3-4 of “waterborne polyurethanes – polyurethane research”; Bayer Polymers, hereinafter as “Bayer”). Hence, 2,2-bis (hydroxymethyl) propionic acid, a kind

of diol, is only one kind of monomer of polyurethane and has to react with another monomer, diisocyanate, to form the polyurethane.

Accordingly, The “includes” used in “A monomer of the waterborne polyurethane includes 2,2-bis (hydroxymethyl) propionic acid” does not broaden the scope but only reflects the common knowledge of polyurethane.

2. All amendments related to weight ratio have been withdrawn.

3. The amendment of changing “diamine containing sulfonate salt” to “a diamine containing a sulfonate functional group” does not have basis.

As explained above point 1, a diamine can be used as a chain extender to prepare the polyurethane. Hence, “diamine containing sulfonate salt” can only be reasonably explained to “a diamine containing (or having) a sulfonate functional group” or “a salt formed by a diamine and a sulfonic acid.” However, since waterborne polyurethane is needed in this application, “a diamine containing (or having) a sulfonate functional group” is much more reasonable, since a sulfonate functional group is a hydrophilic functional group. Therefore, this amendment is based on both the original description and the common knowledge of waterborne polyurethane.

For the third paragraph on page 6 (page 6, line 21 to page 7, line 9):

4. The amendment of changing “the lipophilic monomer solves in the phase change material” has been withdrawn.

5. All amendments related to weight ratio have been withdrawn, and hence no decimal accuracy of the prior cited percentages is changed.

For the third paragraph on page 14 (page 14, line 23 to page 15, line 2):

6. The amendment of “The waterborne polyurethane is polymerized by hydrophilic monomers” has been withdrawn.

Accordingly, reconsideration and withdrawal of these objections are respectfully requested.

#### **Claim Rejection - 35 U.S.C. §112, First Paragraph**

With respect to Paragraphs 3-4 of the Office Action, the Office Action rejected claims 26-34 under 35 U.S.C. §112, first paragraph for failing to comply with the written description requirement.

A. “phase-change material having a polar functional group and a lipophilic moiety” in claim 26

In line 10-15 on page 6 of the specification as filed, “The phase-change material is an organic compound with polarity, such as carboxylic ester. .... A carboxylate of the carboxylic ester is selected from a group formate, acetate and propionate and carbon numbers of an alkoxyl of the carboxylic ester is between 10 and 18” was disclosed. The carboxylate of the carboxylic ester is the polar moiety of the phase-change material, and the long aliphatic chain of the alkoxyl of the carboxylic ester is the lipophilic moiety. Hence, “a phase-change material having a polar functional group and a lipophilic moiety” was inherently disclosed in the original specification and can be simply obtained by common chemistry knowledge.

B. “Wherein the weight ratio of the waterborne polyurethane over the composition is 0.05 – 0.40” in claim 26 and “wherein the weight ratio of the waterborne polyurethane over the composition is 0.10 – 0.30” in claim 30

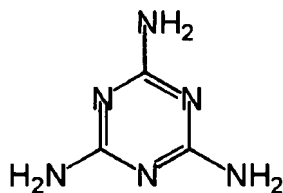
“Wherein the weight ratio of the waterborne polyurethane over the composition is 0.05 – 0.40” in claim 26 has been amend to “wherein the concentration of the waterborne polyurethane aqueous solution is 5% to 40 % by weight”, and “wherein the weight ratio of the waterborne polyurethane over the composition is 0.10 – 0.30” in claim 30 has been amend to “wherein the concentration of the waterborne polyurethane aqueous solution is between about 15% and 35% by weight.” The support can be found in line 5-8 ob page 6 and original claim 1.

C. “Wherein the weight ratio of the lipophilic monomer over the phase-change material and the waterborne polyurethane is 0.03 – 0.12 and 0.25 – 0.5, respectively” and

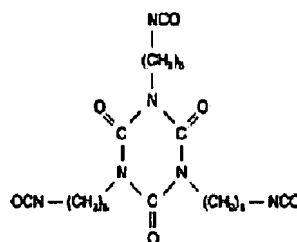
“the lipophilic monomer is isocyanurate of 1,6-hexamethylene diisocyanate, which can react with the waterborne polyurethane to form shells of the microcapsules” in claim 26

“Wherein the weight ratio of the lipophilic monomer over the phase-change material and the waterborne polyurethane is 0.03 – 0.12 and 0.25 – 0.5, respectively” has been amend to “wherein the concentration of the lipophilic monomer in the phase-change material is between about 3% and about 12% by weight and the lipophilic monomer over the waterborne polyurethane is between about 25% and about 50%.” The support can be found in lines 24 on page 6 to line 4 on page 7 of the specification as filed.

As for “the lipophilic monomer is isocyanurate of 1,6-hexamethylene diisocyanate, which can react with the waterborne polyurethane to form shells of the microcapsules” do have support in the original specification, since melamine (Formula 1) is a hydrophilic molecule (not a lipophilic molecule), and “isocyanate salt” is a typographical error of lipophilic “isocyanate.” Since “isocyanurate of 1,6-hexamethylene diisocyanate (Formula II)” is kind of isocyanate and was disclosed in the embodiments, and nothing else can be the lipophilic monomer among the compositions used in the embodiments, isocyanurate of 1,6-hexamethylene diisocyanate must be the lipophilic monomer. Moreover, since isocyanurate of 1,6-hexamethylene diisocyanate have three isocyanate (–NCO) group, it is naturally that isocyanurate of 1,6-hexamethylene diisocyanate can react with the waterborne polyurethane to form shells of the microcapsules.



### Formula I



### Formula II

D. “Wherein the weight ratio of the lipophilic monomer over the phase-change material is 0.05 – 0.10” in claim 31

“Wherein the weight ratio of the lipophilic monomer over the phase-change material is 0.05 – 0.10” has been amend to “wherein the concentration of the lipophilic monomer in the phase-change material is between about 5% and about 10% by weight.” The support can be found in line 25 on page 6 to line 2 on page 7.

E. “Wherein the weight ratio of the lipophilic monomer over the waterborne polyurethane is 0.3 – 0.45” in claim 32

“Wherein the weight ratio of the lipophilic monomer over the waterborne polyurethane is 0.3 – 0.45” have been amended to “wherein the lipophilic monomer over the waterborne polyurethane is between about 30% and about 45%”. The support can be found in lines 2-4 on page 7.

F. “Comprises” of “wherein a monomer of the waterborne polyurethane comprises 2,2-bis (hydroxymethyl) propionic acid” in claim 33

Applicant respect submits that applicant do not understand the meaning of

“Urethane are thereby now encompassed which were not described in the originally filed specification.” As stated above in point 1 of New Matter objection, 2,2-bis (hydroxymethyl) propionic acid is a diol and is a kind of monomer can react with another monomer, diisocyanate, to form polyurethane. Since the propionate functional group of the 2,2-bis (hydroxymethyl) propionic acid is hydrophilic, the obtained polyurethane is waterborne.

G. “Sulfonate functional group” in claim 34

As stated in point 3 in New Matter objection, the basis of “a diamine containing a sulfonate functional group” can be found in the original description and the common knowledge of waterborne polyurethane.


Reconsideration and withdrawal of these rejections are respectfully requested.

**Conclusions**

For all of the above reasons, applicants submit that the specification and claims are now in proper form, and that the claims define patentably over prior arts. Therefore, applicants respectfully request issuance for this case at the Office Action’s earliest convenience. Should the Examiner believe that a telephone conference would be helpful in expediting prosecution of the application; the Examiner is invited to telephone the undersigned at 202-861-1696.

In the event this paper is not timely filed, Applicant petitions for an appropriate extension of time. Please charge any fee deficiencies or credit any overpayments to Deposit Account No. 50-2036 with reference to Attorney Docket No. 87391.0200.

Respectfully submitted,  
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